DOCUMENT RESUME

ED 422 858 IR 018 999

AUTHOR Hughes, Norm
TITLE Using a Materials Database System as the Backbone for a Certified Quality System (AS/NZS ISO 9001:1994) for a Distance Education Centre.
PUB DATE 1998-00-00
NOTE 9p.; In: Distance Learning '98. Proceedings of the Annual Conference on Distance Teaching & Learning (14th, Madison, WI, August 5-7, 1998); see IR 018 976.
PUB TYPE Reports - Descriptive (141) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Certification; *Computer System Design; *Database Management Systems; *Databases; Distance Education; Educational Development; Educational Planning; Foreign Countries; Higher Education; Instructional Design; *Instructional Materials; *Material Development; *Quality Control; Standards
IDENTIFIERS *International Standards; ISO 9001; University of Southern Queensland (Australia)

ABSTRACT

The Distance Education Center (DEC) of the University of Southern Queensland (Australia) has developed a unique materials database system which is used to monitor pre-production, design and development, production and post-production planning, scheduling, and distribution of all types of materials including courses offered only on the Internet. In December 1997, the DEC quality system was certified as meeting the requirements of the international standard AS/NZS ISO 9001:1994. The purpose of this paper is to provide a clear understanding of both the elements of the materials database and its integration with a certified quality system. Stated objectives are to: (1) demonstrate the design of a quality system that adapts the ISO 9001 standards to distance education in a higher education institution; (2) evaluate the scope and objectives of a DEC materials database system for planning, scheduling, production, and preparation of all types of materials; (3) identify the different requirements and outcomes for the four main areas of pre-production, design and development, production, and post-production; and (4) identify the principal elements of integration of a sophisticated materials database system with the ISO 9001 standards. Successes and failures in developing the quality and materials database systems are also described, and future plans are summarized. (AEF)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 422 858

Using a Materials Database System as the Backbone for a Certified Quality System (AS/NZS ISO 9001:1994) for a Distance Education Centre

Dr. Norm Hughes, Associate Director (Operations)
Distance Education Centre, University of Southern Queensland

Background

The University of Southern Queensland (USQ) has been actively involved in distance education since 1977. In the past 20 years, USQ has come to be recognized, both nationally and internationally, as a leading provider of distance education. The Distance Education Centre (DEC) of the USQ houses a state-of-the-art infrastructure for flexible delivery technologies. The DEC has developed a unique materials database system which is used to monitor pre-production, design and development, production and post-production planning, scheduling, and distribution of all types of materials including courses offered only on the internet. In December 1997, the DEC quality system was certified as meeting the requirements of the international standard AS/NZS ISO 9001:1994. Over 19,000 students are serviced by the DEC in 30 countries.

Introduction

The aim of the paper is to provide readers with a clear understanding of both the elements of the materials database and its integration with a certified quality system (AS/NZS ISO 9001:1994). The paper is of relevance to practitioners wishing to improve management systems related to distance education. The objectives of the paper are to:

- demonstrate the design of a quality system that adapts the ISO 9001 standards to distance education in a higher education institution;
- evaluate the scope and objectives of a Distance Education Centre materials database system for the planning, scheduling, production and preparation of all types of materials;
- identify the different requirements and outcomes for the four main areas of pre-production, design and development, production and post-production; and
- identify the principal elements of integration of a sophisticated materials database system with the ISO 9001 standards.

The materials database system and the quality system have been developed specifically around the roles and functions of the USQ distance education centre. Discussion will focus on an evaluation of the integration of the systems and provide an indication of the successes and failures of both systems.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

C.H. Olgren

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

IR018999

Quality System

Description

The DEC quality system is a management system which enables the centre, through documented processes, checks and reviews, to improve administrative efficiency, to operate an efficient and effective production system, and to meet customer needs and expectations. Monitoring the DEC performance for continuous improvement is an intrinsic part of the quality system. To facilitate continuous improvement, DEC has implemented systems to incorporate improvement requests, internal audits, document reviews and procedural reviews. The documented system describes the policies, processes and procedures of planning, controlling and verification whereby the stated DEC Quality Policy is implemented. The system produces records that provide objective evidence of conformance to the requirements of a system designed to meet client needs and expectations.

The DEC Quality System documentation consists of:

- the Executive Manuals (Quality Manual, Documentation Manual, Documentation Maps and the Audit Manual);
- Operations Procedures Manuals;
- Forms Manual; and
- Quality Records.

The system is accessible using electronic files that appear on each staff members' computer desktop. The goal is to have available to all staff the latest controlled version without the time consuming version control of a paper-based system.

Materials Database

Description

The DEC Materials Database system has been developed in-house using Cognos Power House Client software to facilitate the planning, scheduling, production, dispatch and costing of all types of materials produced within DEC. In 1997, DEC was responsible for the production of the following:

- 2250 print pieces
- 50,061,519 print impressions
- 69,319 audio tapes: 23,847 telephone tutorial tapes; 41,566 unit tapes; 3906 other tapes
- 59 video productions
- 739 video dubs from productions
- 2142 video tapes
- 720 off-air recordings
- 11 CD productions
- 550 CDs in-house and 4000 produced by external production houses
- 43 www units for courses

The system has been divided into the following main functional areas:

- **System Administration** involves management of the security and activity monitoring systems.

- **Pre-production** includes a collection and planning phase for the proposed course and unit information and production schedule information.

- **Design and Development** involves the design of a blueprint for study materials, copyright procedures and work requests for the production of print and non-print material.

- **Production** includes scheduling and monitoring of the production of all types of materials (eg print, electronic, multimedia), management of material production numbers versus student quotas, and management of the reproduction of materials.

- **Printery** includes the monitoring of materials produced by the USQ printery.

- **Post-production** involves monitoring the dispatch of materials, costing of materials produced and inventory control.

Planning, Scheduling and Production

The database is essential for planning, scheduling and production.

Planning. In the pre-production phase, the database is used to collect information pertaining to unit offerings, the study materials required and the delivery methods using an instructional blueprint. The information is used by DEC sections to plan resource requirements for the production periods. In the post-production phase, the database is used to draw on historical information for statistical and trend analysis purposes.

Scheduling. The database contains due dates for the production, printing and dispatch of study materials. The database is also used for workload allocation for Instructional Designers and Materials Development Clerks.

Production. The database is used by staff to monitor the entire production process from receiving the material from the Faculties, through various production stages and quality checks, and finally through to dispatch.

The Relationship Between the Quality System and the Materials Database

The relationship between the Quality System and the Materials Database can be considered across the areas of pre-production, design and development, production and post-production. The applicable elements of the ISO standards are shown in brackets below.

In general terms, the Materials Database is used to monitor (Product Identification and Traceability), control (Process Control) and verify (Inspection and Test Status) study materials throughout the various phases of pre-production, design and development, production and post-production. Therefore the function of the Materials Database is closely integrated with several elements of the quality system.

To further illustrate this, the Materials Database features in the following DEC Quality System procedures documents where MAN stands for Management; D&D is Design and

Development, EPS is the Electronic Publishing Services and DIS stands for Distribution Services:

- MAN 1.4.1—USQ Bookshop
- MAN 1.7.1—Materials Database Administration
- D&D 2.1.1—Design and Development Process
- D&D 2.1.2—Audiotape Production Process
- D&D 2.1.3—Videotape Production Process
- D&D 2.2—Unit Specifications
- D&D 2.3—Pre-production
- EPS 5.1.1—Booking In
- EPS 5.1.2—Production
- EPS 5.1.3—Proofing
- EPS 5.1.4—Printery Preparation
- EPS 5.2—Examinations
- DIS 6.4—Stock Control

Integration of the Database With the ISO Standards

The major functions of the Materials Database that are integrated with the elements of the ISO Standards are described with examples as follows:

- **4.8—Product Identification and Traceability.** To establish and maintain documented procedures for identifying the product by suitable means from receipt and during all stages of production and delivery (Joint Technical Committee QR/8, Quality Systems, p. 6).

  For example each individual piece of study material is coded, based on the unit number, which can then be tracked through all the various stages of pre-production, design and development, production and post-production.

- **4.9—Process Control.** To identify and plan the production processes that directly affect quality and shall ensure that these processes are carried out under controlled conditions (Joint Technical Committee QR/8, Quality Systems, p. 6).

  For example as each individual piece progresses through the various production processes, including proofing and quality checks, piece status and benchmark dates must be recorded on the database before the piece can progress to the next stage.

- **4.12—Inspection and Test Status.** The inspection and test status of product shall be identified by suitable means, which indicate the conformance or non-conformance of product with regard to inspection and tests performed (Joint Technical Committee QR/8, Quality Systems, p. 12).

  For example each individual piece has a recorded status. Some examples include "prod": the piece is in production; "proof": the piece is at the proofing stage; "final"; the piece has been proofed and is ready for printery preparation.

Other database areas integrated within the ISO Standards are included as examples using the standards numbering system:

- **4.2.3—Quality Planning.** The supplier shall (provide) . . . identification of suitable verification at appropriate stages in the realisation of product (Joint Technical Committee QR/8, Quality Systems, p. 3).

  For example, the monitoring of each individual piece allows staff to ascertain which stage it is at, what the status of the piece is, and whether it has passed the proofing stages and quality checks.

- **4.4.7—Design Verification.** At appropriate stages of design, design verification shall be performed and recorded to ensure that the design stage output meets the design stage input requirements (Joint Technical Committee QR/8, Quality Systems, p. 4).

  For example, when a new or major change piece is submitted into DEC, design verification is recorded on the Materials Database by the Instructional Designer (activity monitoring as input date verified) before it progresses to the production stages;

- **4.13—Control of Non-conforming Product.** To establish and maintain documented procedures to ensure that product that does not conform to specified requirements is prevented from unintended use (Joint Technical Committee QR/8, Quality Systems, p. 8).

  For example, the system prevents any print materials from undergoing printery preparation until the materials have passed the proofing stages and have been signed out on the database by the Materials Development Clerks.

- **4.16—Control of Quality Records.** All quality records shall be legible and shall be stored and retained in such a way that they are readily retrievable (Joint Technical Committee QR/8, Quality Systems, p. 9).

  For example, staff have access to the information contained in the Materials Database including production stages, piece status, inspection/testing status and activity tracking. Staff are also able to run enquiries and reports from the system.

Successes and Failures in Developing the Systems

In developing both the quality system and the materials database systems, there have been both successes and failures.

The Quality System

The initial decision to develop a quality system was made in order to gain an advantage when tendering for external business contracts involving customised staff development courses. Other reasons for seeking certification included improving administrative efficiency; reducing operational failures and consequential rework; cutting the costs of failures and increasing credibility in the marketplace. Quality certification is an incentive to international students to enrol in USQ courses, which provides an opportunity for USQ to increase market share particularly in Asia.

The quality system is very "user-friendly." The success of the system is based on a greatly enhanced working knowledge and high acceptance of system processes by DEC staff. In the certification document, the senior auditor stated:

> Overall the Quality System shows compliance as evidenced by various records viewed. The level of quality system knowledge demonstrated by staff was extremely impressive. As the system has been documented to fit around the processes and practices of the business, it demonstrates a sound approach to quality management. The system will ultimately serve as an effective tool to help achieve continuous improvement. (Sci-Qual International, p. 3)

Apart from controlling the processes that affect the quality of DEC products/services, the quality system is also designed to identify procedural areas for improvement using various continuous improvement mechanisms such as Improvement Requests, internal audits and document/procedure reviews. This ensures the success of the system. For example, the use of Improvement Requests has led to improvements in the tracking, testing and verification of study materials produced by DEC as well as reducing wastage and associated costs. To date the quality system has not "failed" in any way as staff fully support the system and participate in its improvement.

Materials Database

The primary purpose of the Materials Database system is to provide a central data repository of all materials produced and despatched within DEC (ie print, electronic and multimedia). It provides a monitoring system which tracks the production of the materials from the pre-production (planning) process through to the dispatch and costing processes.

The initial decision to develop the Materials Database arose from the need for better management and control of the processes involved in producing study materials. Previously, most processes and records were maintained manually. The system was also developed to provide an integrated and comprehensive overview of the entire process, whereas the previous records concentrated only on specific areas.

Once targeted stages of the materials Database were implemented, the system provided more control over the processes involved in the production of print materials. As a result of this success, the system was expanded to include the processing of other types of materials (eg. electronic media).

Another success of the Materials Database has been the availability of management information of the entire production process. Reports that are streamed from the system have been designed to provide timely and accurate information that can be used for planning, monitoring and decision making.

Similarly with the quality system, the success or failure of the Materials Database depends largely on the commitment of the staff who use it. The information extracted from the database is only as good as the data that is put in—therefore data integrity is vitally important. Also, if staff are unwilling to accept the use of the database, then they can potentially slow the development of the system. Problems have been experienced in these areas.

Since the implementation of the Materials Database, numerous system enhancements have been made in order to meet the changing needs and requirements of staff and the associated processes. Improvements have been made as a result of staff members realizing the potential of the system and the benefits that can be gained from its use and further development.

Future Developments

Plans for the Quality System

The quality system will:

- ❖ continue to act as a catalyst to improve DEC procedures and processes and therefore improve the quality of DEC products/services;
- ❖ continue to be integrated with the procedures and processes relating to the materials database so that the systems compliment each other; and
- ❖ be reviewed in its entirety on a yearly basis to ensure that the needs and goals of DEC are achieved.

Plans for the Materials Database

The goals are:

- ❖ to extend the monitoring of processes involved in the design of study materials;
- ❖ to expand the tracking of processes required for the production of electronic and multimedia materials;
- ❖ to develop an inventory control system covering all materials produced; and
- ❖ to develop an effective reporting and query environment covering all levels of reporting requirements that will compliment and enhance the existing reporting system.

Conclusion

The USQ has invested considerable time and money in developing both the Quality and Materials Database systems. A recent University review commented on the improved productivity of the Distance Education Centre, which can be attributed to the integration of both systems. As a result, the expectations of clients, students, staff and management are being met in most instances.

The conference presentation will include examples of some of the detail of both systems. The author wishes to acknowledge the input of Peter Munster, Management Systems Officer, DEC, USQ, who provided the background information for the paper.

References

Sci-Qual International. (1997). *AS/NZS ISO 9001:1994. Quality Assessment Report*. DOC NO: SQI/14 (8/94) R.2 Hobbins, C: Author.

Joint Technical Committee QR/8, Quality Systems (1994). *Australian/New Zealand Standard: Quality systems-Model for quality assurance in design, development, production, installation and servicing* (AS/NZS ISO 9001:1994). Sydney: Joint Technical Committee QR/8, Quality Systems.

Autobiographical Sketch

Dr. Norm Hughes is a highly experienced post-secondary education academic and administrator. During the past 24 years, he has held positions as: Associate Dean, and Head of Programme, in the Faculty of Education at the Darling Downs Institute of Advanced Education; Director of Administration of the University College of Southern Queensland; Director, Special Projects involving continuous improvement programs at the University of Southern Queensland (USQ) and currently Associate Director (Operations) of the Distance Education Centre at the USQ. His PhD studies included a dissertation entitled "Total Quality Management: the Application of Information Technology" (1993) which included institutions in Australia and the USA including the University of Wisconsin (Madison).

Address: PO Box 7440
Toowoomba Mail Centre, 4352
Queensland, Australia
Email: hughes @ usq.edu.au
Phone: + 64 7 46312585
Fax: + 64 7 46311502